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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,082	04/24/2001	Joo Soo Lim	049128-5006	2174

9629 7590 04/02/2004

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EXAMINER	
QI, ZHI QIANG	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/840,082	LIM ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,297,862 (Murade).

Claims 1, 5, 9, 11, 15 and 19, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) a liquid crystal display comprising:

(concerning claims 1 and 11)

- a pixel electrode (10) at a pixel area between a gate line (14) and data line (13);
- a switching device (thin film transistor TFT) (12) at an intersection between the gate line (14) and the data line (13);
- a light-shielding member (black matrix) (11) overlapping the switching device (TFT) (12);

(concerning claims 5 and 15)

- a charging device (a storage capacitor between the gate line 14 as the lower electrode and the upper metal thin film 15 as the upper electrode) on the gate line (14);

- a light-shielding member (black matrix) (11) overlapping the switching device (TFT) (12);
- a light-shielding member (black matrix) (11) overlapping the charging device (the storage capacitor);

(concerning claims 1, 9 and 19)

- a light-shielding member (black matrix) (11) on a front substrate (2) opposed to the rear substrate (1), and at a boundary portion between pixel areas (10);
- a light-shielding member (black matrix) (11) for blocking light incident onto the drain electrode (the thin metal film) (7) of the switching device (TFT) (12) and for blocking light incident onto the storage capacitor upper electrode (a metal film) (15).

AAPA does not expressly disclose the light-shielding member (black matrix) extending from an end at the pixel electrode side of a drain electrode (metal thin film) of the TFT (the extending portion would be a dummy black matrix) and extending from an end at the pixel electrode side of the storage capacitor upper electrode (metal thin film) (the extending portion would be a dummy black matrix) into the pixel area, and the light-shielding member (black matrix) covering and extending past all sides of the drain electrode (metal thin film) with a margin sufficient to block light incident on the metal thin film.

However, Murade discloses (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix 6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device

(TFT, such as the source/drain regions 1a and 1b) and extending from the drain region into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, so that is sufficient to block light incident onto the drain/source region (the metal thin film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured. Murade also indicates (col.16, line 43 – col.17, line 53) that the capacitance line (16) must be shielded from light, it is necessary for a black matrix placed on an opposed substrate (31) to have a sufficiently large area, so that the adverse effect due to incident light will be negligible, and this arrangement minimizes the leakage current.

Since such light-shielding arrangement would sufficiently block the light incident to the TFT, so as to minimize the leakage current of the TFT, such that the device can present a display of high quality images free from image degrading effect such as cross-talk.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to extend the light-shielding film covering the drain electrode and covering the storage capacitor upper electrode from an end of the pixel electrode side, i.e., a light-shielding member (black matrix) covering and extending the drain electrode (metal thin film) and covering the capacitance line (charging device) with a margin sufficiently blocking light incident onto the drain electrode as claimed in claims 1, 5, 9, 11, 15 and 19 for minimizing the leakage current of the TFT, improving the display contrast, and presenting a display of high quality images free from image degrading effect such as cross-talk.

Claims 2, 6, 12 and 16, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the light-shielding member (11) is at a front substrate (2) opposed to a rear substrate (1) which includes the switching device (TFT 12), pixel electrode (10), the charging device (storage capacitor), and a liquid crystal layer between the two substrate.

Claims 3, 7, 13 and 17, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the light-shielding member is a black matrix.

Claims 4 and 14, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the switching device is a thin film transistor (TFT 12) at the intersection between the gate line (14) and the data line 913) for driving the pixel electrode (10), and the drain electrode made of metal is connected to the pixel electrode (10) via contact hole (9).

Claim 8, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the charging device is a storage capacitor including an upper electrode (15) formed with the gate line (14) wherein a dielectric layer (gate insulating layer 4) is at between the upper electrode (15) and the gate line (14), and the upper electrode made of metal.

Claims 10 and 20, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the drain electrode (7) is connected to the pixel electrode (10) via contact hole (9), and the storage capacitor upper electrode (15)

is at between the gate line (14) and a dielectric layer (passivation layer 8); and all the electrode must be made of metal as the electrical conductivity.

Claim 18, AAPA discloses (the specification of page 2, paragraph 0003 – page 4, paragraph 0008; Figs. 1-3) that the storage capacitor upper electrode (15) made of metal over the gate line (14) and a dielectric layer (gate insulating layer 4).

3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Murade as applied to claims 1-20 above, and further in view of US 6,266,117 (Yanagawa et al).

Claim 21, concerning the material of the light-shielding member is formed with an organic material containing a black pigment, Yanagawa discloses (co.7, lines 1-2) that the light shielding film is made of an organic resin in which, e.g., black pigment is dispersed, so that using the organic resin containing a black pigment as a light shielding member would be a routing skill in the art, and that was common and known in the art as the light shielding property of the organic material containing a black pigment.

Therefore, it would have been obvious to those skilled in the art to use an organic material containing a black pigment as a light shielding member as claimed in claim 21 for shielding light because the organic material containing a black pigment having the property to absorb light.

Response to Arguments

4. Applicant's arguments filed on Feb.13, 2004 have been fully considered but they are not persuasive.

Applicant's arguments are as follows:

1) The reference Murade suggests removal of the black matrix over the transistor when an additional metal structure is present adjacent the transistor, and no motivation to combine.

Examiner's responses to Applicant's arguments are as follows:

1) The reference Murade indicates (col.16, line 43 – col.17, line 53) that the capacitance line (16) (charging device) must be shielded from light, and it is necessary for a black matrix placed on an opposed substrate (31) to have a sufficiently large area, so that the adverse effect due to incident light will be negligible, and this arrangement minimizes the leakage current, and that is a motivation to combine; and a suggestion that does not mean the reference does not disclose using black matrix over the transistor. The reference Murada clearly disclose (col.1, lines 30-41) that TFT is covered by a black matrix to prevent the channel region of the TFT from being exposed to direct light.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
March 27, 2004

TARIFUR R. CHOWDHURY
RY EXAMINER